

# Meeting on August 27th 2002

**Minutes taker** Ina Reichel

**Those present** J. Corlett, I. Reichel, A. Wolski, W. Wan, A. Zholents

**Date** August 29 2002

**Distribution**

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## Overview of topics

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## 1 Relaxing $R_{56}$ in the first compressor (A. Wolski, A. Zholents)

Sasha looked at the effect of a jitter between the laser at the source and the RF. For 1 ps jitter (which is a typical value that should not be too hard to achieve), the bunch is 10 ps long after the acceleration instead of 2 ps if two compressors are used or without the jitter. In addition the bunch has a much larger energy spread. Reducing the jitter to 0.5 ps only improves the result slightly and such a small jitter might be impossible to achieve.

Using two compressors but a relaxed  $R_{56}$  of 0.18 m in the first one gives a bunch length of about 4.0 ps after acceleration with an only somewhat increased energy spread.

For comparison, with the “nominal” compressors the bunch length is about 3.5 ps after acceleration for a 1 ps jitter.

It looks like using two compressors compensates for the jitter by some kind of cancellation mechanism. We might therefore not want to do away with the first compressor altogether.

Andy looked at the effect of using a single compressor on the transverse dynamics. In order to find any chromatic effects caused by rf focusing, he increased the energy spread significantly. Only with an energy spread of 20 % he found a small chromatic effect. Therefore chromatic effects should be negligible.

## 2 Update on a design of the first bunch compressor (W. Wan)

Weishi managed to reduce the number of magnets needed significantly for a lattice with an  $R_{56}$  of a little more than 0.2 m using COSY (due to differences in definitions, this corresponds to a little less than 0.2 m in MAD). All k-values are below 20. One point of worry is the  $\beta$ -function in the center quadrupole which is only about 0.02 m. The lattice in his current solution is sketched in Fig. 25.

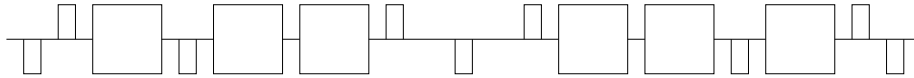


Figure 25: Schematic lattice for the first compressor (not to scale).

## 3 TraFiC4 (I. Reichel)

Ina has converted the second compressor into TraFiC4 format and is currently checking that the transformation is correct, i.e.  $\beta$ -functions etc. come out correctly.